FIG.1
PRIOR ART

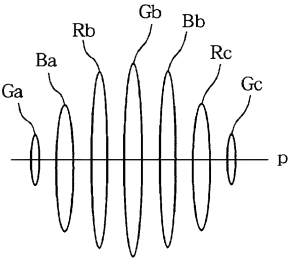

FIG.2
PRIOR ART

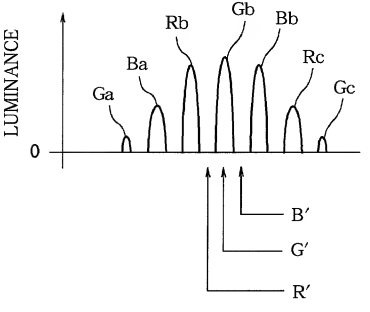

FIG.3

PRIOR ART

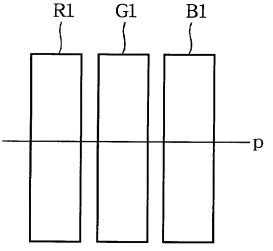

FIG.4

PRIOR ART

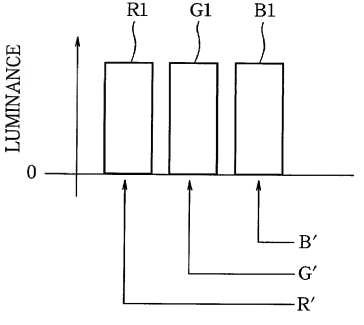

FIG.5

PRIOR ART

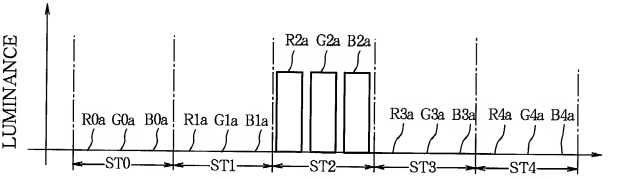

FIG.6

PRIOR ART

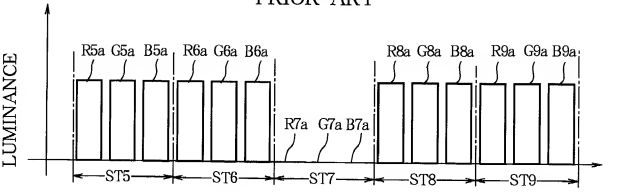

FIG.7

PRIOR ART

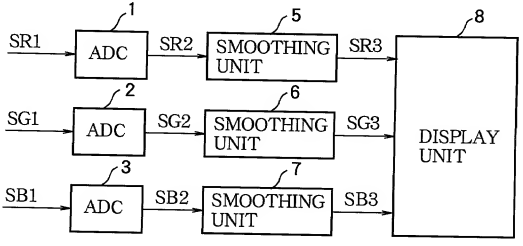

FIG.8

PRIOR ART

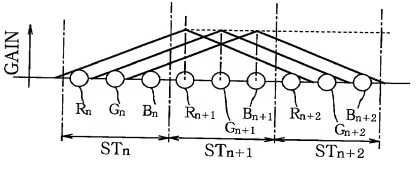

FIG.9

PRIOR ART

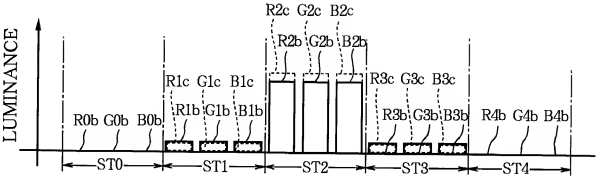

FIG.10

PRIOR ART

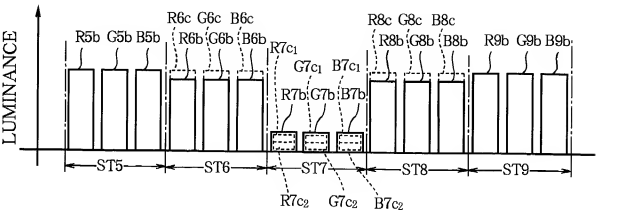

FIG.11

PRIOR ART

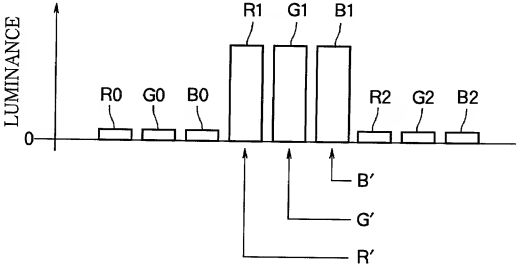

FIG.12

PRIOR ART

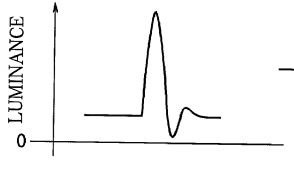

FIG.13

PRIOR ART

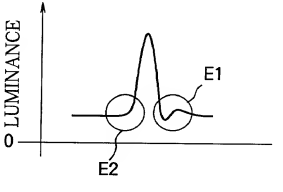

FIG.14

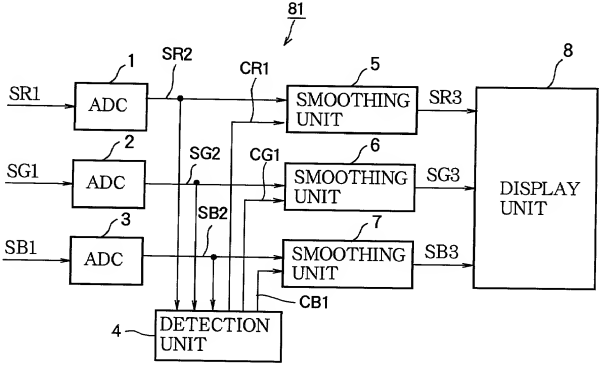
81
1
SR2
CR1
5
8
SR1
ADC
SMOOTHING UNIT
SR3
2
SG2
CG1
6
SG1
ADC
SMOOTHING UNIT
SG3
DISPLAY UNIT
3
SB2
7
SB1
ADC
SMOOTHING UNIT
SB3
CB1
4
DETECTION UNIT

FIG.15

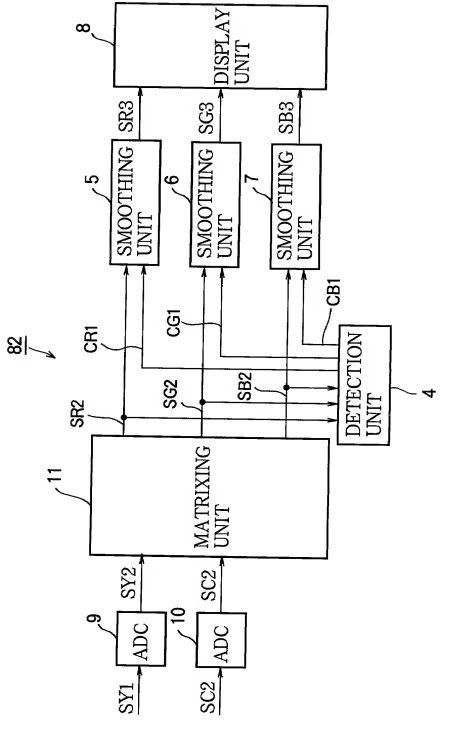
SY1
SC2
ADC
ADC
9
10
SY2
SC2
11
MATRIXING UNIT
82
SR2
SG2
SB2
CR1
CG1
CB1
DETECTION UNIT
4
SMOOTHING UNIT
SMOOTHING UNIT
SMOOTHING UNIT
5
6
7
SR3
SG3
SB3
DISPLAY UNIT
8

FIG.16

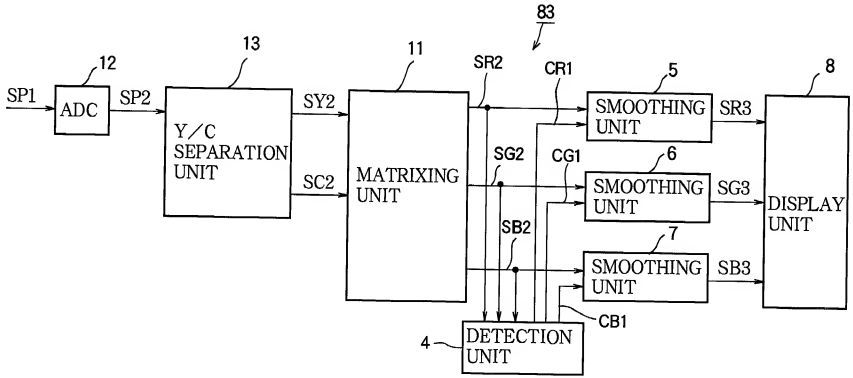
83
13
11
12
SR2
CR1
5
8
SP1
ADC
SP2
Y/C SEPARATION UNIT
SY2
SC2
MATRIXING UNIT
SMOOTHING UNIT
SR3
SG2
CG1
6
SMOOTHING UNIT
SG3
DISPLAY UNIT
SB2
7
SMOOTHING UNIT
SB3
CB1
4
DETECTION UNIT

FIG.17

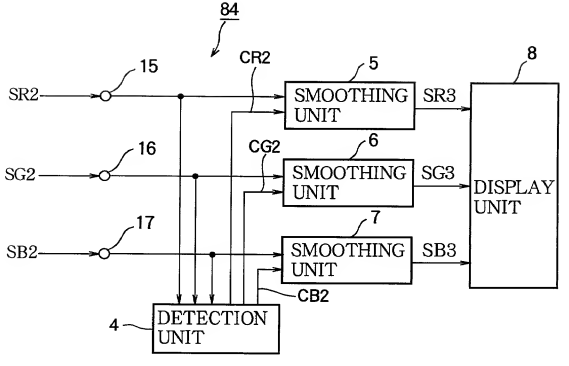
84
15
CR2
5
8
SR2
SMOOTHING UNIT
SR3
16
CG2
6
SG2
SMOOTHING UNIT
SG3
DISPLAY UNIT
17
7
SB2
SMOOTHING UNIT
SB3
CB2
4
DETECTION UNIT

FIG.18

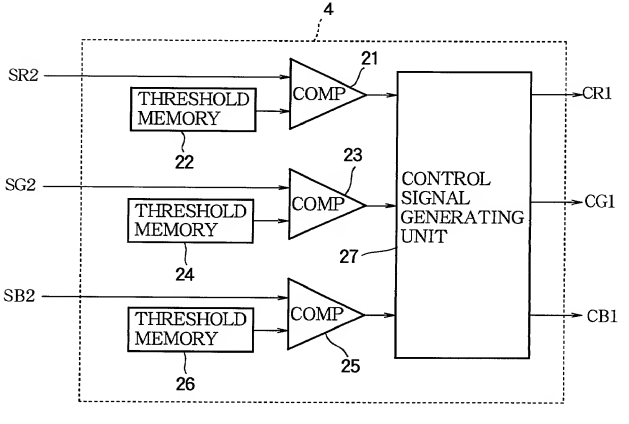
4
21
SR2
THRESHOLD MEMORY
COMP
CR1
22
23
SG2
THRESHOLD MEMORY
COMP
CONTROL SIGNAL GENERATING UNIT
CG1
27
24
SB2
THRESHOLD MEMORY
COMP
CB1
25
26

FIG.19

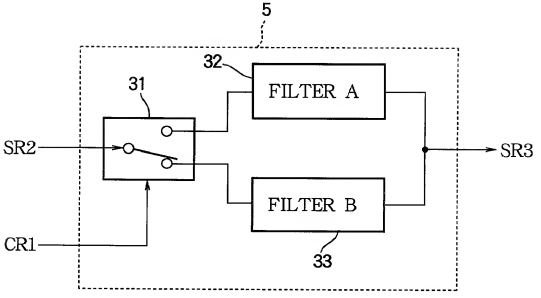

FIG.20

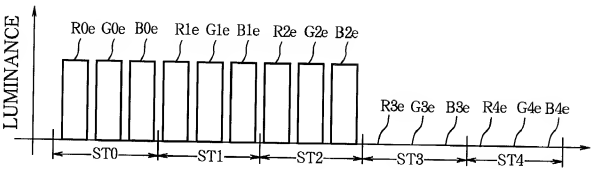
LUMINANCE
R0e G0e B0e
R1e G1e B1e
R2e G2e B2e
R3e G3e B3e
R4e G4e B4e
ST0
ST1
ST2
ST3
ST4

FIG.21

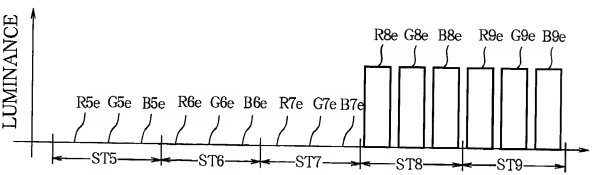
LUMINANCE
R5e G5e B5e
R6e G6e B6e
R7e G7e B7e
R8e G8e B8e
R9e G9e B9e
ST5
ST6
ST7
ST8
ST9

FIG.22

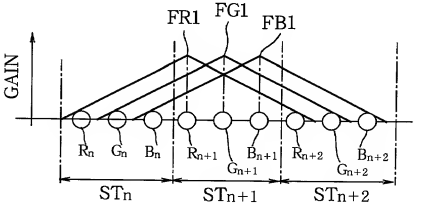

FIG.23

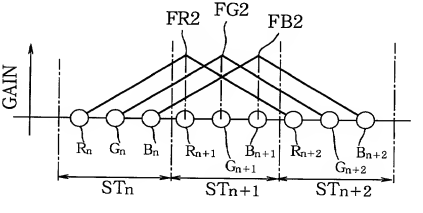

FIG.24

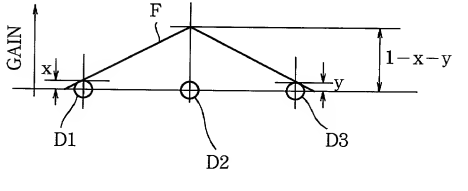

FIG.25

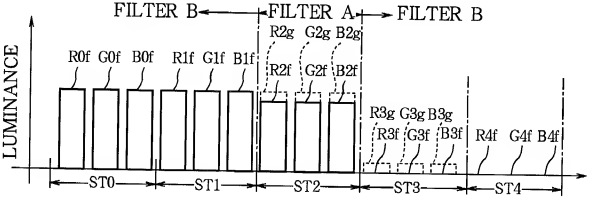
FILTER B
FILTER A
FILTER B
LUMINANCE
R0f G0f B0f R1f G1f B1f
R2g G2g B2g
R2f G2f B2f
R3g G3g B3g
R3f G3f B3f
R4f G4f B4f
ST0
ST1
ST2
ST3
ST4

FIG.26

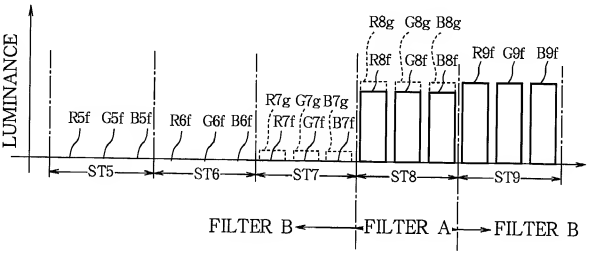
LUMINANCE
R5f G5f B5f
R6f G6f B6f
R7g G7g B7g
R7f G7f B7f
R8g G8g B8g
R8f G8f B8f
R9f G9f B9f
ST5
ST6
ST7
ST8
ST9
FILTER B
FILTER A
FILTER B

FIG.27

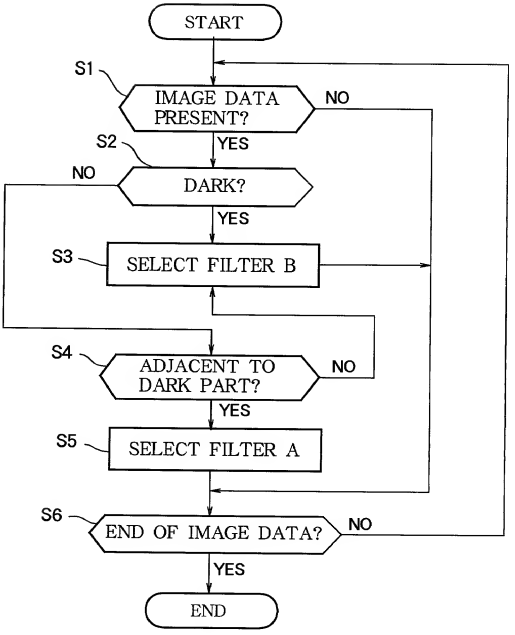
START
S1
IMAGE DATA PRESENT?
NO
YES
S2
NO
DARK?
YES
S3
SELECT FILTER B
S4
ADJACENT TO DARK PART?
NO
YES
S5
SELECT FILTER A
S6
END OF IMAGE DATA?
NO
YES
END

FIG.28

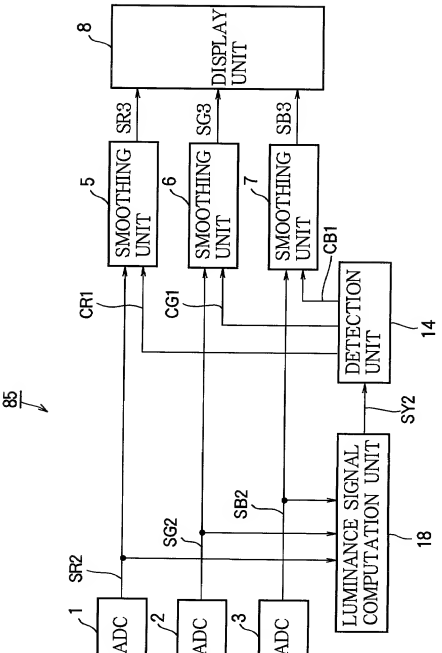
85
SR1
SG1
SB1
1
ADC
2
ADC
3
ADC
SR2
SG2
SB2
LUMINANCE SIGNAL COMPUTATION UNIT
18
SY2
DETECTION UNIT
14
CB1
CR1
CG1
5
SMOOTHING UNIT
6
SMOOTHING UNIT
7
SMOOTHING UNIT
SR3
SG3
SB3
8
DISPLAY UNIT

FIG.29

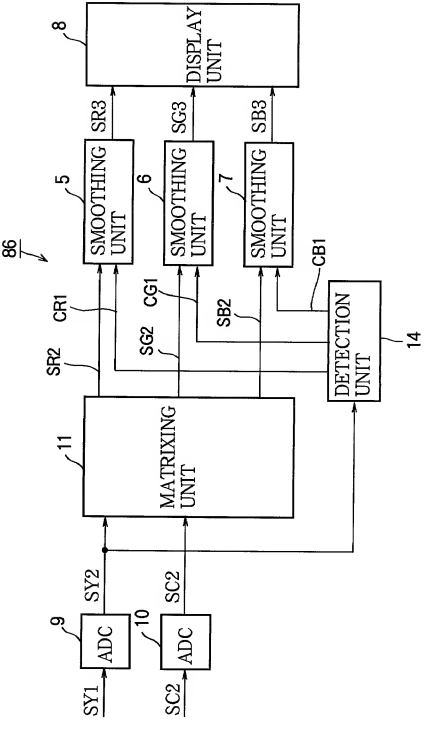
SY1
SC2
ADC
ADC
9
10
SY2
SC2
11
MATRIXING UNIT
SR2
CR1
SG2
CG1
SB2
CB1
DETECTION UNIT
14
86
SMOOTHING UNIT
SMOOTHING UNIT
SMOOTHING UNIT
5
6
7
SR3
SG3
SB3
8
DISPLAY UNIT

FIG.30

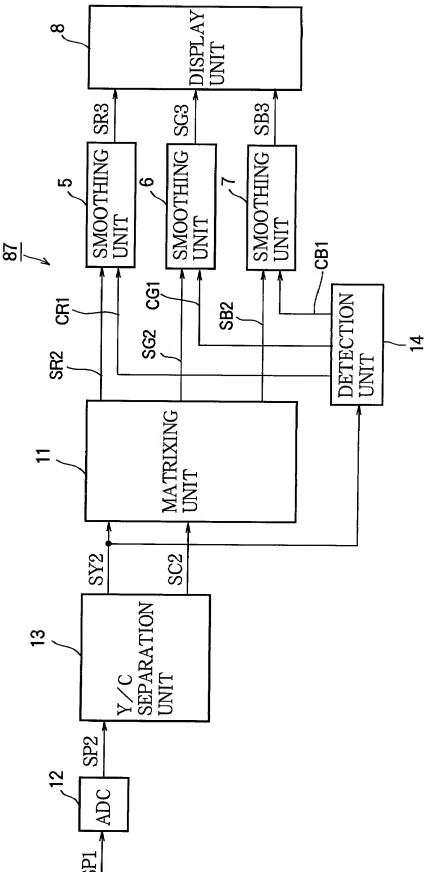
SP1
12
ADC
SP2
13
Y/C SEPARATION UNIT
SY2
SC2
11
MATRIXING UNIT
SR2
SG2
SB2
CR1
CG1
CB1
87
DETECTION UNIT
14
5
SMOOTHING UNIT
6
SMOOTHING UNIT
7
SMOOTHING UNIT
SR3
SG3
SB3
8
DISPLAY UNIT

FIG.31

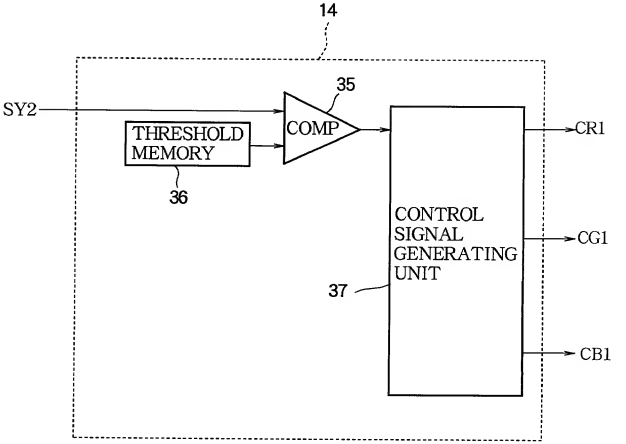
14
35
SY2
THRESHOLD MEMORY
COMP
CR1
36
CONTROL SIGNAL GENERATING UNIT
CG1
37
CB1

FIG.32

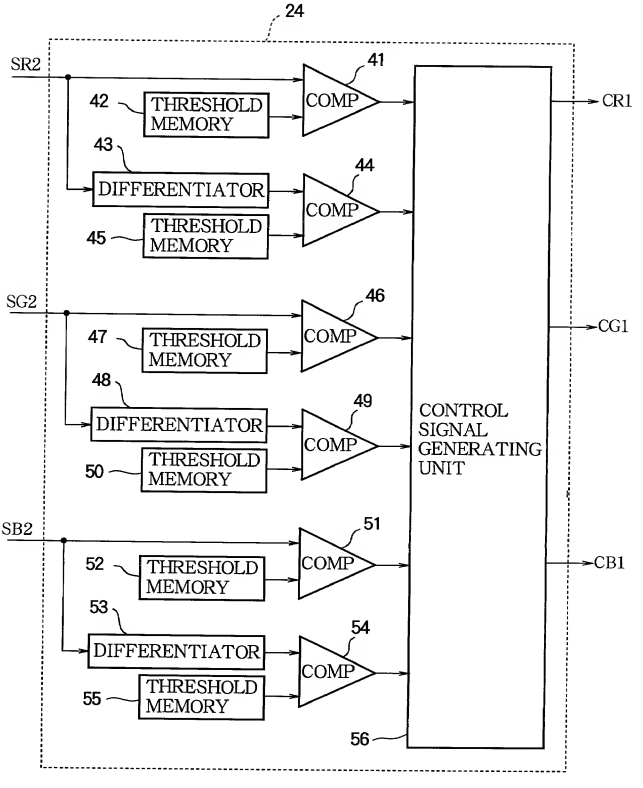
24
SR2
41
42
THRESHOLD MEMORY
COMP
CR1
43
DIFFERENTIATOR
44
COMP
45
THRESHOLD MEMORY
SG2
46
47
THRESHOLD MEMORY
COMP
CG1
48
DIFFERENTIATOR
49
COMP
CONTROL SIGNAL GENERATING UNIT
50
THRESHOLD MEMORY
SB2
51
52
THRESHOLD MEMORY
COMP
CB1
53
DIFFERENTIATOR
54
COMP
55
THRESHOLD MEMORY
56

FIG.33

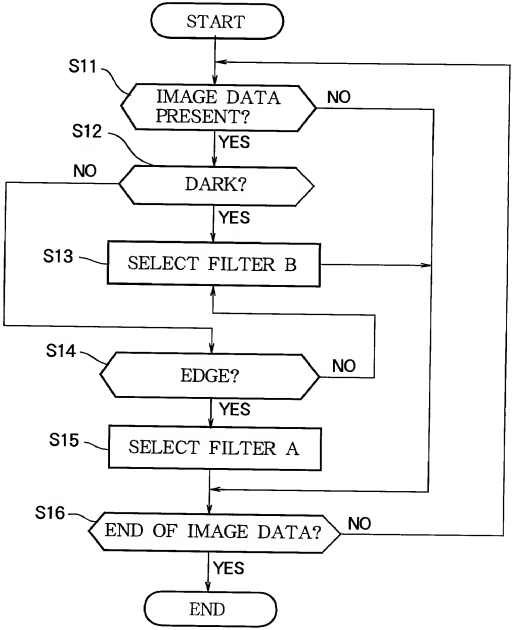
START
S11
IMAGE DATA PRESENT?
NO
YES
S12
NO
DARK?
YES
S13
SELECT FILTER B
S14
EDGE?
NO
YES
S15
SELECT FILTER A
S16
END OF IMAGE DATA?
NO
YES
END

FIG.34

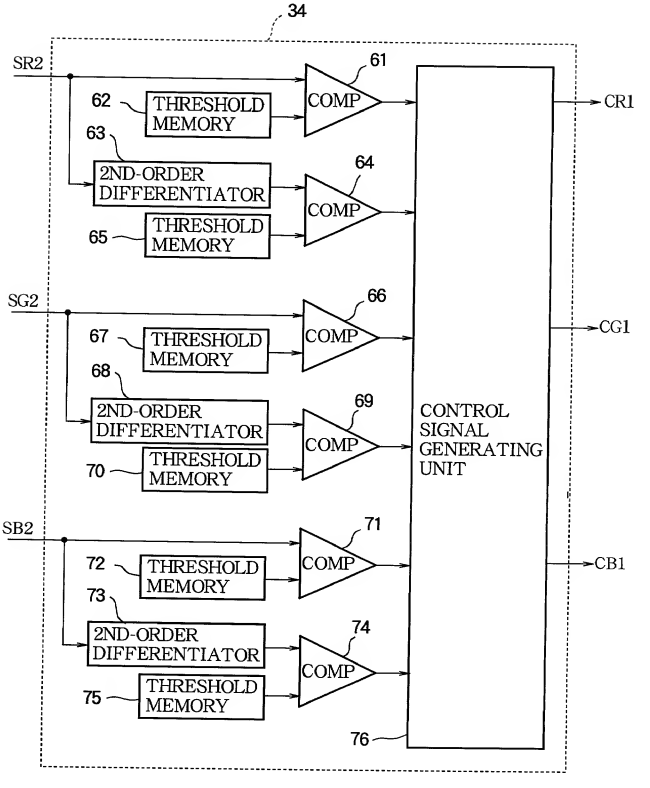
34
SR2
61
62
THRESHOLD MEMORY
COMP
CR1
63
2ND-ORDER DIFFERENTIATOR
64
COMP
65
THRESHOLD MEMORY
SG2
66
67
THRESHOLD MEMORY
COMP
CG1
68
2ND-ORDER DIFFERENTIATOR
69
COMP
CONTROL SIGNAL GENERATING UNIT
70
THRESHOLD MEMORY
SB2
71
72
THRESHOLD MEMORY
COMP
CB1
73
2ND-ORDER DIFFERENTIATOR
74
COMP
75
THRESHOLD MEMORY
76

FIG.35

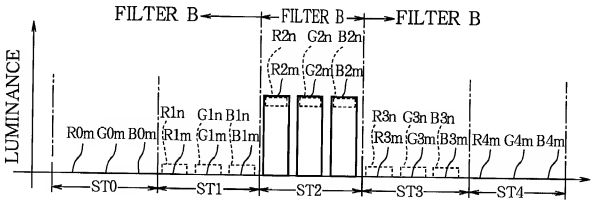
FILTER B
FILTER B
FILTER B
LUMINANCE
R2n G2n B2n
R2m G2m B2m
R1n G1n B1n
R0m G0m B0m
R1m G1m B1m
R3n G3n B3n
R3m G3m B3m
R4m G4m B4m
ST0
ST1
ST2
ST3
ST4

FIG.36

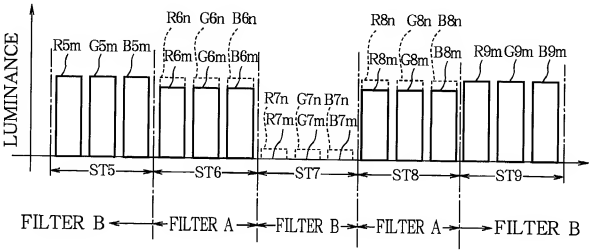
R6n G6n B6n
R8n G8n B8n
LUMINANCE
R5m G5m B5m
R6m G6m B6m
R8m G8m
B8m
R9m G9m B9m
R7n G7n B7n
R7m G7m B7m
ST5
ST6
ST7
ST8
ST9
FILTER B
FILTER A
FILTER B
FILTER A
FILTER B

FIG.37

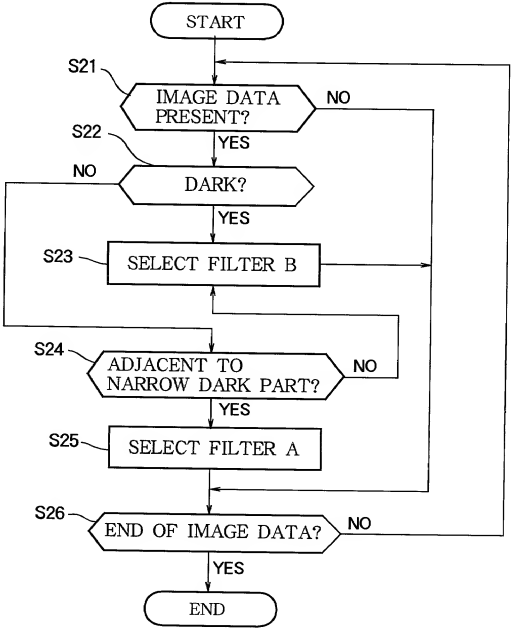
START
S21
IMAGE DATA PRESENT?
NO
YES
S22
NO
DARK?
YES
S23
SELECT FILTER B
S24
ADJACENT TO NARROW DARK PART?
NO
YES
S25
SELECT FILTER A
S26
END OF IMAGE DATA?
NO
YES
END

FIG.38

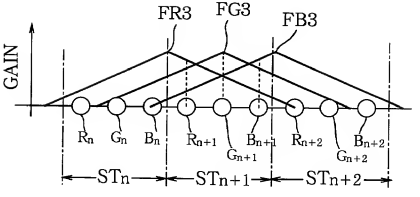

FIG.39

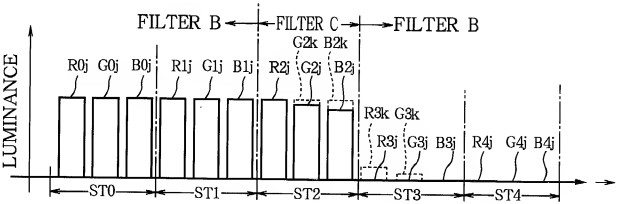
FILTER B
FILTER C
FILTER B
LUMINANCE
R0j G0j B0j
R1j G1j B1j
R2j G2j B2j
G2k B2k
R3k G3k
R3j G3j B3j
R4j G4j B4j
ST0
ST1
ST2
ST3
ST4

FIG.40

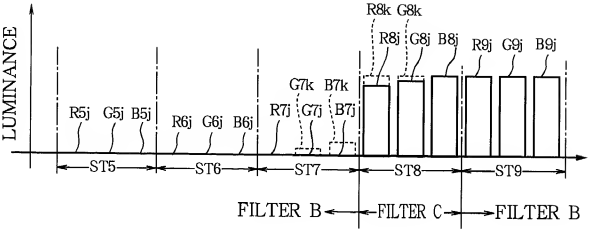
LUMINANCE
R5j G5j B5j
R6j G6j B6j
R7j G7j B7j
G7k B7k
R8k G8k
R8j G8j B8j
R9j G9j B9j
ST5
ST6
ST7
ST8
ST9
FILTER B
FILTER C
FILTER B

FIG.41

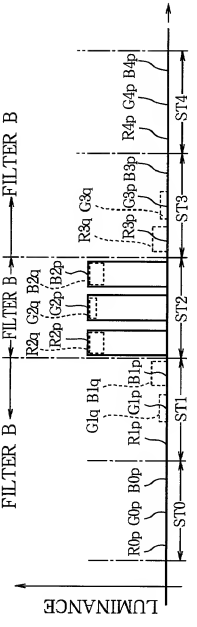
FILTER B
FILTER B
FILTER B
FILTER B
R0p G0p B0p
G1q B1q
R1p G1p B1p
R2q G2q B2q
R2p G2p B2p
R3q G3q
R3p G3p B3p
R4p G4p B4p
ST0
ST1
ST2
ST3
ST4
LUMINANCE

FIG.42

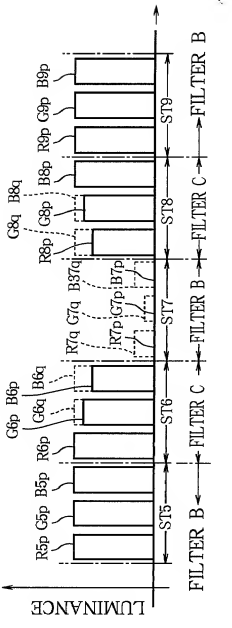
R5p G5p B5p
G6p B6p
R6p G6q B6q
R7q G7q
R7p G7p B7p
B37q
R8p G8p
G8q B8q
R8p B8p
R9p G9p B9p
ST5
ST6
ST7
ST8
ST9
LUMINANCE
FILTER B
FILTER C
FILTER B
FILTER C
FILTER B

FIG.43

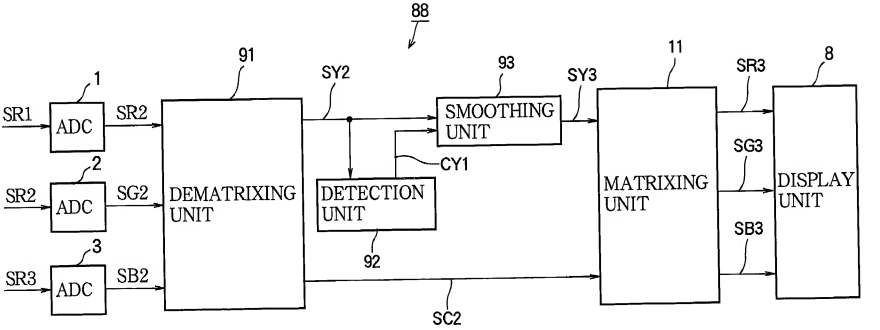

FIG.44

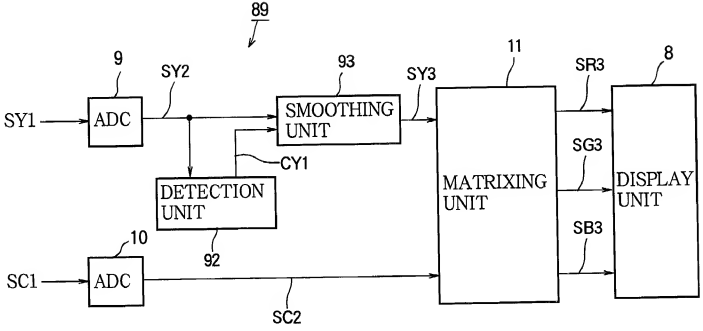
89
9
SY2
93
SY3
11
SR3
8
SY1
ADC
SMOOTHING UNIT
SG3
CY1
DETECTION UNIT
MATRIXING UNIT
DISPLAY UNIT
SB3
10
92
SC1
ADC
SC2

FIG.45

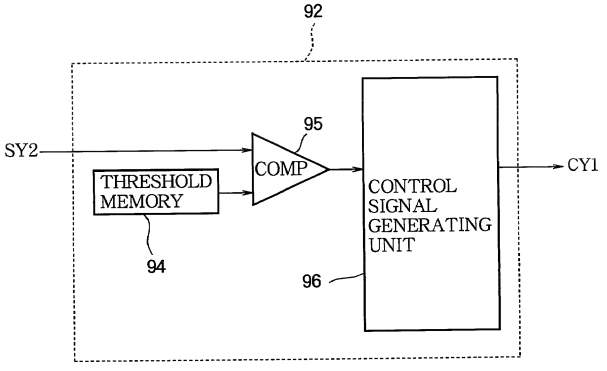
92
SY2
95
COMP
THRESHOLD MEMORY
94
CONTROL SIGNAL GENERATING UNIT
CY1
96

FIG.46

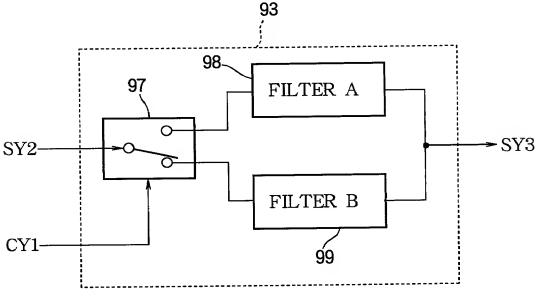
93
98
97
FILTER A
SY2
SY3
FILTER B
CY1
99

FIG.47

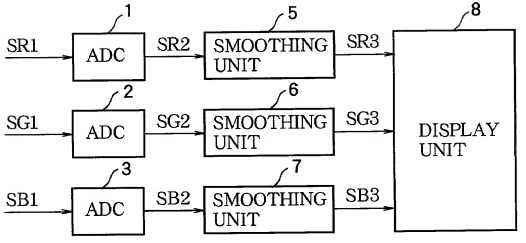
1
5
8
SR1
ADC
SR2
SMOOTHING UNIT
SR3
2
6
SG1
ADC
SG2
SMOOTHING UNIT
SG3
DISPLAY UNIT
3
7
SB1
ADC
SB2
SMOOTHING UNIT
SB3

FIG.48

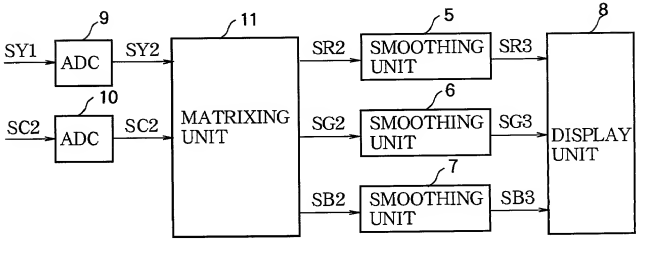
9
11
5
8
SY1
ADC
SY2
SR2
SMOOTHING UNIT
SR3
10
6
SC2
ADC
SC2
MATRIXING UNIT
SG2
SMOOTHING UNIT
SG3
DISPLAY UNIT
7
SB2
SMOOTHING UNIT
SB3

FIG.49

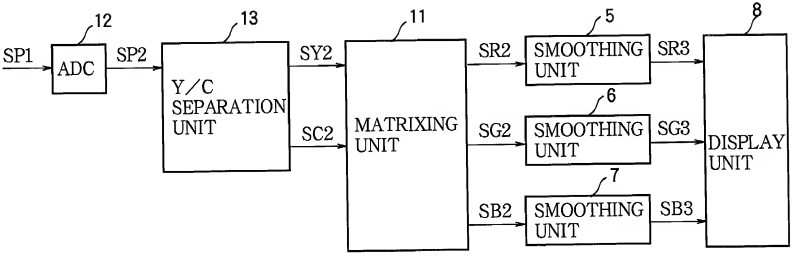

FIG.50

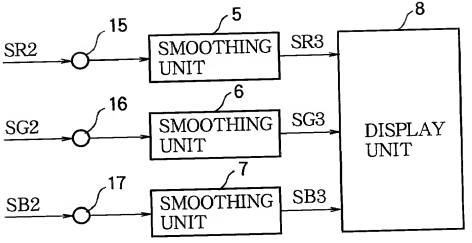

FIG.51

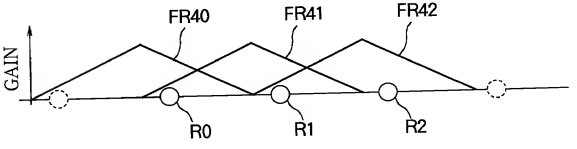

FIG.52

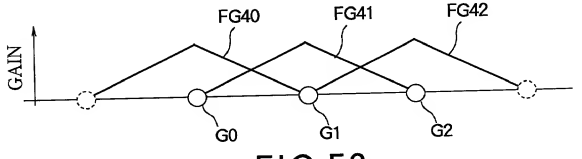

FIG.53

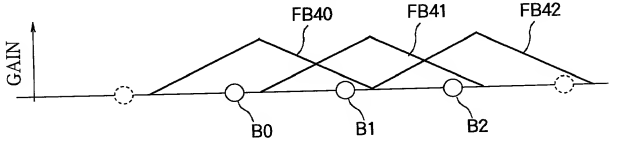

FIG.54

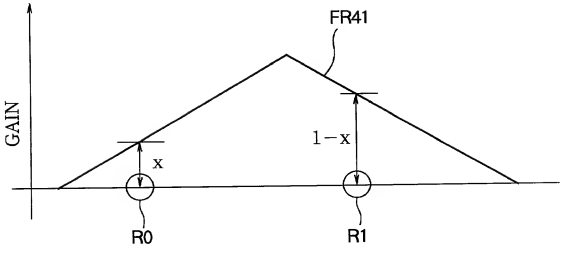

FIG.55

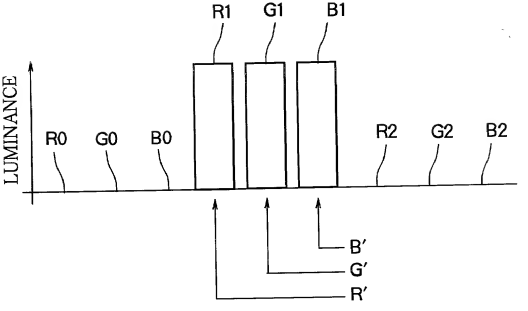
R1
G1
B1
LUMINANCE
R0
G0
B0
R2
G2
B2
B′
G′
R′

FIG.56

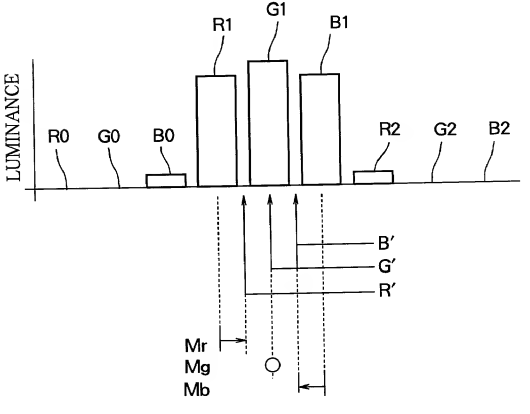
G1
R1
B1
LUMINANCE
R0
G0
B0
R2
G2
B2
B′
G′
R′
Mr
Mg
Mb

FIG.57

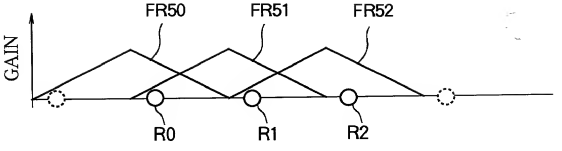

FIG.58

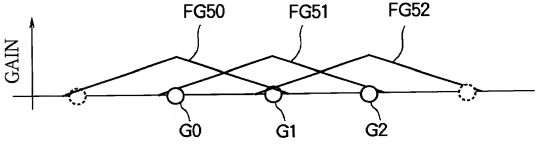

FIG.59

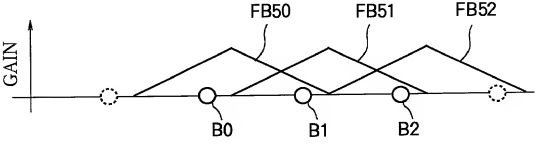

FIG.60

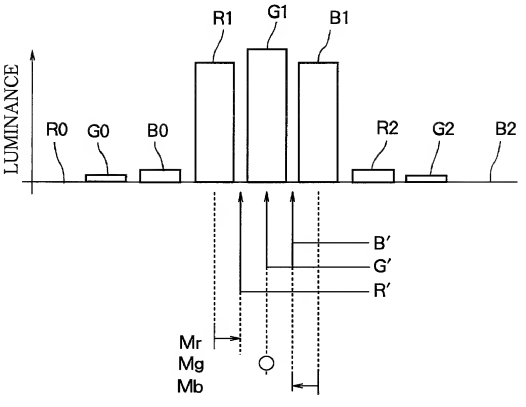

FIG.61

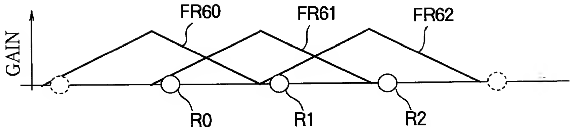

FIG.62

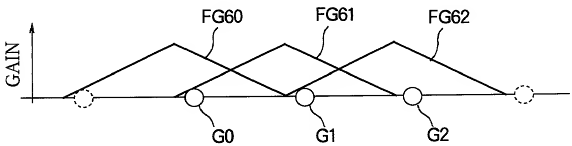

FIG.63

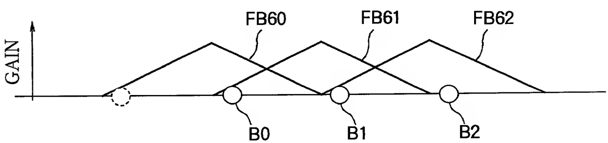

FIG.64

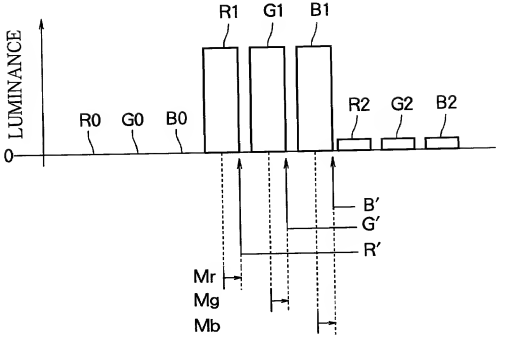

FIG.65

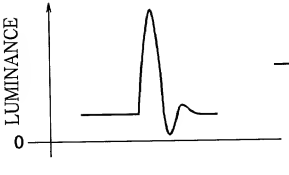

FIG.66

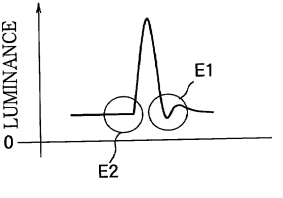

FIG.67

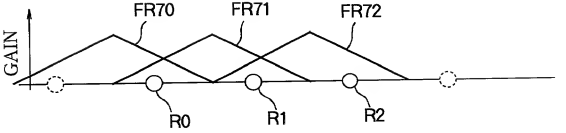

FIG.68

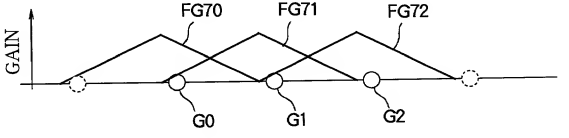

FIG.69

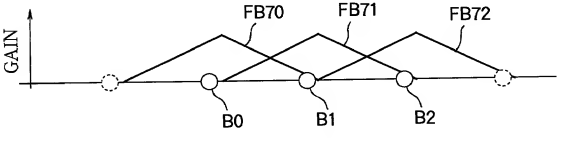

FIG.70